

The LongPath

A North Alabama DX Club Publication

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From the President

Our lives are careening toward a new normal, wherever that may be. We'll have to adapt and it has to start now. As you know, we cannot have our meeting at Newk's on Tuesday, April 14. So we'll beat the virus and have a virtual meeting instead. Let's meet on the DX Club's 147.30 repeater at 7PM on that same night. HARC had 50 members check in to their net two weeks ago. It works. Please check in with us.

The repeater has been almost dormant for a while but it does work, and has a very wide coverage area. If you haven't checked how well you can hit it, please do a test prior to the meeting. I had to check that my 2m radio still even worked at all. I'll run a directed net, and get the check-ins. Then I'll make a few announcements, and get on to the program.

I didn't realize just how important club activities are to our members until I asked for articles for the Long Path a short while back. I was overwhelmed!! Members stepped forward to write several articles. Just look at this Long Path issue and observe the deep interest by so many members. This is a very strong membership, and I ask more of you to participate in writing articles for our next issue. It isn't hard. Everyone has something to contribute. Let's keep this up, at least until we can meet again. As a hint, you can likely expect another virtual meeting in May. And yes,

members have already stepped forward to present programs in May and June. Kudos!

It is unfortunate that the virus has had a terrible impact on travel for DXpeditions now and for the next month or so. You can go to NG3K.com/Misc/adxo.html and observe that the April schedule has been totally wiped out and May is disappearing quickly. We had been looking at this site over the past few meetings, and seen over a dozen DXpeditions every month. Don't despair, the DX is still out there, just not the team DXpeditions.

We have just one more month of notifications and votes before implementing the new constitution changes. Since they are not urgent, we'll put off this action until we can get together again.

I have invited a speaker for the DX Banquet in August, but haven't gotten a response yet.

The subject for this month's presentation is the History of SWR/Wattmeters. I'll try to keep it short. The Power Point file is on our website, NADXC.org. Just go there and download it, so you can see it on your computer screen as I talk my way through it.

Cont'd on p. 12

SWR/Wattmeters

April Program by Bob DePierre, K8KI

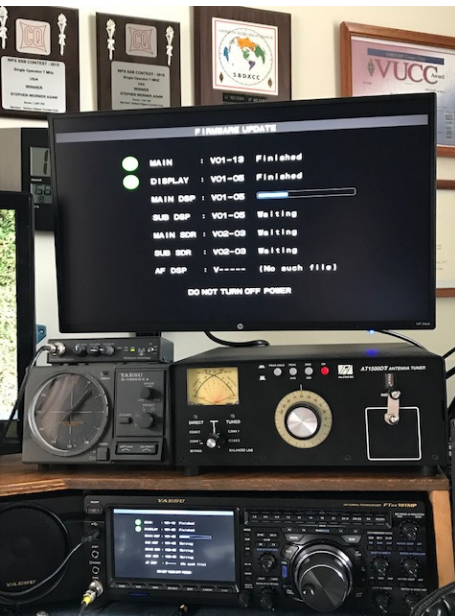
Let's see how this works. Bob's presentation on SWR/Wattmeters will be downloaded from www.nadxc.org by members in attendance to the virtual meeting, using the 147.30 repeater for audio. Bob will give the repeater a rest every 90 seconds or so, both in the meeting and presentation. Do the same if you have something to say. Give it a try next Tuesday!



A Time to Remember

By Steve Werner, AG4W

This will become a time that will be remembered by many much like 9/11. We have all learned new things like social distancing. Fortunately ham radio and many of my hobbies and interests cater to social distancing. The CQWW WPX contest was held last weekend. To prepare for it I violated my rule of never update firmware in your radio before a contest. Yaesu made many updates to my new FTDX-101MP so I couldn't resist. The first few times I tried I was not successful, but after sleeping on the issue the next day I got it to work. Updating firmware always has risk with it. This radio has 7 firmware packages of which 6 were updated. If something goes wrong like a power outage when you update then it is a trip back to the factory. I have tested a number of the changes and they make the radio even better. I expect Yaesu will continue to update their new flagship radio during the next year to make it even better. Many including me have given them suggestions. It is great so much can be fixed in firmware now.



Update in Progress—don't touch!

In the WPX contest I operated single operator non assisted high power on 40 meters only.

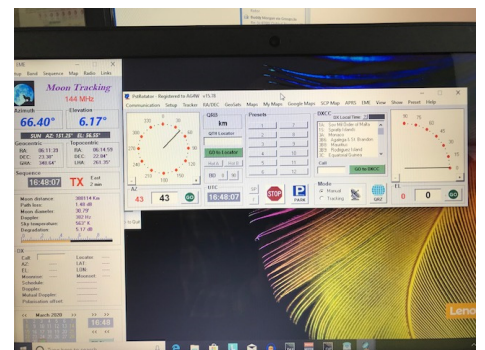
Band Summary			
Score:	1,474,536		
	QSO	Pts	Pref
160M	0	0	0
80M	0	0	0
40M	1718	2814	524
20M	0	0	0
15M	0	0	0
10M	0	0	0
Total	1718	2814	524

I had my best score last year but came in second in the US. I made more contacts this year 1718 vs. 1619, but had less multipliers 524 vs. 544. The score ended up about the same as last year. I didn't think propagation to Europe was that good for hams in the southeast. I enjoyed operating my new FTDX-101. During the SSB contest I set the bandwidth to 1650 Hz. I also used the mid setting on AGC instead of the default slow setting most of the time. I spent some time experimenting with the sync feature. I was able to listen to the 3 element parasitic vertical on the main receiver and a beverage on the sub receiver. I could then use one or the other or both to get the best reception. On 80 or 160 meters I always switch between the beverages and the 8 circle vertical receive array.

In social isolation I have also continued to update my EME station. I now have automatic rotor control for my Yaesu G-450 azimuth and G-550 elevation rotor. I purchased this from Vibroplex. They are a distributor for ERC. The ERC-M has a control card that I mounted in a plastic enclosure I already had and relay boards that go in each rotor. I built them as a kit. I had some part problems and it did take some time to



get the replacements, but it is up and running. I can also use it to track the many AMSAT satellites besides the moon. I use a the PstRotator tracking program which has many features.

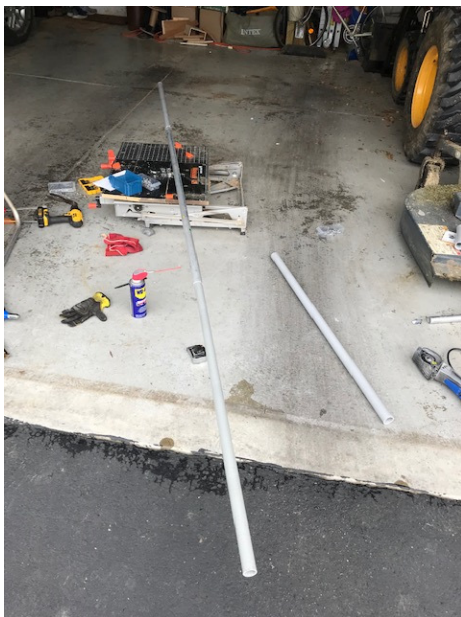


I am also in the process of converting my vertically polarized 2X13 element 2 Meter yagis to horizontal polarization. This requires the use of a fiberglass boom which I did not have originally. I am using double wall 1/8 inch fiberglass on each end of the boom, so on 1 1/2" tubing one half inch of it is fiberglass. In the middle of the boom I am using triple wall aluminum tubing. I was hoping to calculate exactly the thickness of the fiberglass and aluminum tubing required and decided to

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A Time to Remember (cont'd from p. 2)

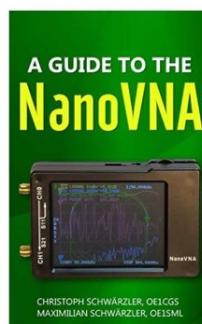
just try and over-engineer it. The polarization changes when you do EME, but 80 percent of the contacts most make use horizontal polarization. The more elaborate stations can switch between horizontal and vertical polarization. I hope this helps my EME country count in the near future.



I have also decided to adopt power pole for my DC interconnections. I purchased another interconnection block at HamCation. This should make future updates to the station a little easier. I am really glad I went to HamCation this year since the Dayton Hamvention has been canceled. I sure hope this virus is under control before the Huntsville Hamfest. I think our warm humid summer weather may help reduce the problem before August. I sure am disappointed my Swains trip is delayed. I would of been coming home about now. I have received 2 shirts for everyone that I am bringing to Swains. I also have 3 flags now including the one from our club.



I have also been learning about my new NanoVNA and oscilloscope. I purchased a Kindle book that was great to learn about the VNA. It is an amazing piece of test equipment everyone should have. They keep coming out with better ones that are larger and operate at higher frequencies. I also now have a digital oscilloscope thanks to Bob K8KI. This will continue to come in handy for many of my projects. I love the old Tektronix oscilloscopes.

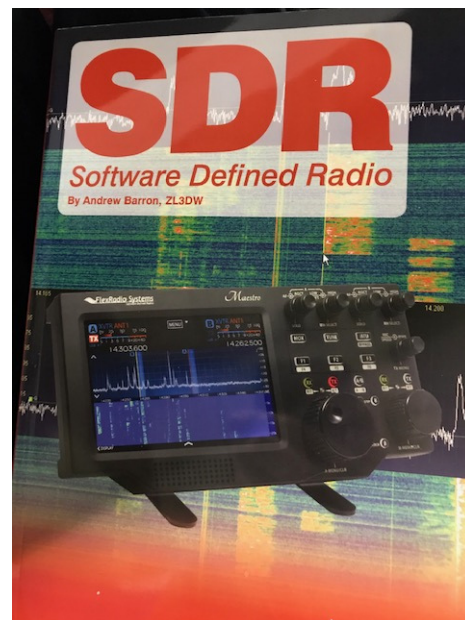


I have also taken this time to go for bike rides and start my garden this year. The tomatoes have come up indoors and I started 32 potato plants outside yesterday. For many of you that



are still working this is probably your first chance to see what it will be like when you retire and have time to do many of the projects you have wanted to do. You can also just read a good book like the one I just started on Software Defined Radios.

73 Steve AG4W



Feedline Considerations

By Bruce Smith, AC4G

Last fall, many of you attended the North Alabama DX Club's (NADXC) annual picnic at our family farm in Taft, Tennessee. As many of you may have noticed, I have several HF antennas some a great distance away from my shack with some distances exceeding 300 feet or greater. As hams, we all know feedlines are required to get your transmitted signal from your transceiver to the antenna and to get signals received by your antenna transmitted by other radio amateur operators to your receiver. One might wonder how much of a signal loss can be attributed due to the great distance from my transceiver to any one of my antennas. Perhaps a larger diameter feedline should be used or perhaps I should move my antennas closer to my shack. This brings us to briefly examine basic feedline theory.

Feedlines

Feedline comes in a variety of forms. Two basic types of feedlines used at HF frequencies that we all are familiar are coaxial cable (coax) and ladder-line. Radio amateurs typically use either of these in their stations configurations. However, both types have their own pros and cons which I will discuss.

Coax cable consists of a center conductor surrounded by another conductor called a "shield" sandwiched between a dielectric providing electrical insulation between both conductors. The dielectric is either solid, foam, or air. An outer jacket protects the cable.

Ladder-line began in the early-1900s by ham operators running two parallel wires with insulators separating the two wires. Today, wire manufacturers produce ladder line by the thousands of feet on rolls. These are called windowed line produced with plastic insulating material. Ladder-line exhibits low RF loss versus coax. However, ladder-line is not used everywhere due to

a couple of issues.

Ladder-line can be several hundred ohms. Ladder-line is manufactured exhibiting both 300 Ohms and 450 Ohms. However, this presents an issue since modern HF transceivers have antenna jacks that are 50 Ohms impedance. In order to use ladder-line, the radio amateur must use an antenna tuner to match the transceiver impedance to that of ladder-line.

When using ladder-line, the feedline must be kept relatively straight as nearby metallic objects affect performance. The parallel wires/conductors generate magnetic fields that balance each other which is why ladder-line is referred to as "balanced line". Ice on the ladder-line can affect the feedline's impedance.

Both types of feedline have loss which can convert transceiver power to heat and from signals received by the antenna. Three factors affect feedline performance: frequency, length, and SWR.

Feedline Characteristics

Feedline loss increases with frequency - the higher the frequency, the higher the loss. Length of feedline is another factor to consider. The longer the line, the greater the loss. Last of all, Standing Wave Ratio (SWR) which is the amount of energy returning to your transceiver due to radio waves either combining, adding or subtracting from each other affects feedline loss. Hams measure SWR using an SWR meter in line with their transceiver and antenna. The higher the SWR, the greater the standing wave along the feedline resulting in lost RF energy.

Looking at the loss table in the ARRL Antenna Handbook, one can calculate the loss in one's feedline. The loss of 100 feet run of RG-8 having a loss at 28 MHz is 1.6dB per 100 feet. For my

300-foot run of RG-8, the loss is 4.8dB since the antenna is 300 feet away from the transceiver. Anything beyond 2 dB is considered excessive; therefore, I had to consider another type of feedline to reduce feedline losses from my shack to my antennas. This required some calculations before making a final decision and path ahead.

Feedline Loss Calculations for AC4G

I have two antennas with 300' transmission lines. I'm worried about the dB losses and which line is the best to feed them with. I am lucky enough to have one of the new antenna analyzers, a Rig Expert AA-170. The analyzer tells me that the impedance is 32+j42 on my wire dipole antenna (30m) and 39+j15 on my HF Yagi antenna (10m).

To solve my problem, I first look in the ARRL Handbook for the chapter on Transmission Lines. There I find the standard loss table for the various lines available to me. The loss for 300' is 3 times the loss for 100' due to the long length of feedline from my shack to each antenna. The table below shows the loss in dB for 300' of feedline.

Feedline Type	30m Loss	10m Loss
RG-58	3.21 dB	5.40
RG-213	1.74	3.75
0.5" hard line	0.63	1.17
450Ω Ladder-line	0.24	0.30

Next, I had to calculate the additional losses due to the SWR that will be imposed on the line. This will take several steps as described. First, I have to calculate the SWR for each case (it's different for 50Ω and 450Ω feedline). Second, I have to find the 'additional losses' from the graph in the ARRL Handbook. And finally, I have to add up all the losses and make my hard decision.

Cont'd on p. 5

Feedline Considerations

(cont'd from p. 4)

My trusty Rig Expert analyzer gave me the two complex impedances for my antennas. From this, I must calculate the SWR. First, find the reflection coefficient ρ . Look again in the ARRL Handbook to find

$$|\rho| = \sqrt{\frac{(R_1 - R_0)^2 + X^2}{(R_1 + R_0)^2 + X^2}}$$

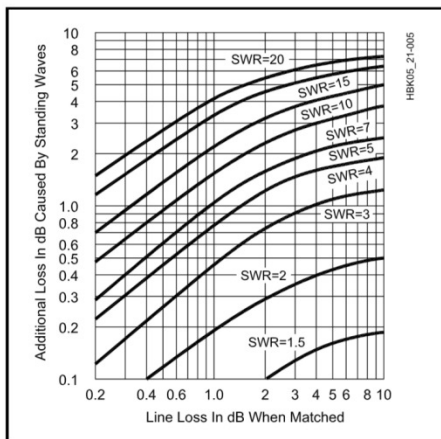
and then

$$SWR = \frac{1 + |\rho|}{1 - |\rho|}$$

I just entered the equations and data into MS Excel, and had the results in an instant. The SWR for each feedline is shown below:

Band	Z	50Ω SWR	450Ω SWR
30m	32+j42	3.0:1	14:1
10m	39+j15	1.5:1	11.5:1

Now find the Additional Loss Table in the ARRL Handbook. Below is the pertinent data:



Now we can look up the additional losses and make up our final table showing total losses (in dB).

Feedline Type	30m Loss dB	10m Loss dB
RG-58	3.21+.9 = 4.11	5.4+.17 = 5.57
RG-213	1.74+.65=2.39	3.75+.15 = 3.90
Hard Line	0.63+.2 = 0.83	1.17+.10 = 1.27
450Ω Ladder-line	0.24+.65 = 1.14	0.30+.7 = 1.00

Well, I have a hard decision to make here. Perhaps you can tell me what I should do?

There are a couple of other factors to consider here. One is that with poor SWR, the power handling capability of RG-58 and RG-213 leaves little clearance before arcing occurs at 1500 watts output from the amplifier. The 450Ω ladder-line (twin lead) has astronomical voltage clearance. Obviously, I have to keep it off the ground for the 300' run. The Ladder-line (twin lead) also causes some very high SWR, which I have to deal with.

Also, these two 300' runs of coax have been in the family for 40 years, and I have dragged them around the world with me from Taft, TN to the Marshall Islands and back to Taft. I have a sort of affection for them, even though they have lived with the rain, bugs,

squirrels and salt spray for the entire time. I worry that they don't meet the loss specs from the Handbook any more.

From our simple calculations taking into account the losses that can occur as discussed earlier, I could have a stronger signal if I considered changing my feedline. Perhaps I am content working a contest or Dxpedition with this current configuration, but I could rule the band by lowering the feedline losses.

Perhaps you are in the same boat and should consider changing your feedline. If you'd like to find out how to use your analyzer to find the actual loss parameters of your old cables, then stand by for the program by N5DF next month at the NADXC Club Meeting to show you how.

Life as a YL

By Jessica Beckling, KN4JJA

Coffee. Check. Dog leashed to the run. Check. Folded dipole still in its proper and upright position. Check, wait, did it slip on one side or do I need to go get my glasses?this is my typical Saturday morning routine as I look out on our backyard. The vertical appears to still be standing behind the garage. Pine trees lining the back of the property hide the apex of the DX80 and it's fall from grace during the last few storms. Coax winds like snakes across the grass awaiting their final burial. This is not the yard I knew just a few eight months ago where I hardly

weeded and had let the bramble grow up wherever it wanted. Bushes and trees had died in various spots and I figured I would get to them someday but now I look out and see the hours of teamwork and satisfaction on a project accomplished and the benefits of the hard work put in. This has included an "easy" removal of a rotten tree that nearly required a certain party of men wearing protective suits and a red truck to make a little appearance. Towering inferno doesn't do the scenario justice. What was supposed to be the quick

Cont'd on p. 6

The Casual DXer — Self-Isolating, but not Isolated

By Kevin Hibbs, KG4TEI

As most of you know I am at a point in my life where chasing DX and long stents of butt-in-chair time are not easy to come by. Family and work priorities have made it difficult to get more than a few hours a month of time behind the radio. This has changed lately though with the current state of the world being on lock down due to COVID-19. I have tried to make the most of a bad situation, and take advantage of being home in the middle of the day. I still have to work, but my time is a little more flexible. I decided to focus on 17M, one of my least populated DXCC bands in my LOTW account.

On March 18 I started with only seven confirmed DX contacts on 17M. As I write this article, I am proud to say that I have managed to log a total of 33 DX entities on 17M, with seven of those being all time new ones. All this has been made possible by the invention of FT8. This mode has made it easy for me to keep an eye on what is on the band and not in my log without completely taking my focus off work. If I see something new, I can pause what I'm doing for a minute or two, work the station, and jump back into getting my job done.

For this casual DXer it has been a game changer. If the TV pundits are right, I will likely be home for a several more weeks. I don't know that I will get DXCC on 17M by the end of this, but I am sure I will be a lot closer than I was a month ago. Even the darkest cloud can have a silver lining.

73 until next month,

Kevin KG4TEI

Life as a YL (cont'd from p. 5)

maiden installation of the DX80 turned out to be an afternoon event of smoky proportions. Let's just say a gas can was involved at some point...The DX80 didn't go up for another two weeks. Steve Molo has officially entered and now permanently resides in my life..

A tennis ball is wedged up in a tree by the garage where we tied and launched the mastrant so we could get the folded dipole up higher. It is stuck there in plain sight on a tiny stub of a limb and just out of reach, taunting us with its neon color against the dark brown of the bark. After hours of adjusting and adjusting, I have never wanted to cut down a tree, watch it go up in flames and dance in glee over its death more than I have that one. Someday, someday. The folded dipole is attached to a different tree now, in case you were wondering. Those pine trees on the back border holding the DX80 tried to kill Steve as he worked on trimming branches away from the vertical. He claims it was me but that ladder was wobbling on its own, I pinky promise. We have assembled from

scratch a hexbeam antenna whose instructions were written by Germans who, I am convinced, consulted the Chinese. I am also mostly positive they, the Chinese that is, have sadistically conditioned us in how to assemble things their way. That hexbeam was erected in two days and most of it was spent agonizing and pouring over the instructions and measuring all of our cuts. We have arranged, rearranged, and moved everything back in our detached garage/shack more times than I can count. . But we have also hosted friends, a youth amateur club, and soon, co-workers to join in the fun of our little ham world. It is supposed to hold two cars, but who uses a garage for that?? Our shack is a work in progress, as all are. Housing a 7300 and 9700 under a shelf holding dual monitors, the monstrosity of the 1960's Boeing desk sits in the back. On the surrounding walls are certificates and maps, awards and antenna pieces. I don't have any awards on that wall... yet..but there will be.

I describe all of this to say, this is the

home of amateur radio operators. He has many many years of experience and I am just getting started. I have had my general license for over a year and the extra license study book is on my nightstand (it's a little dusty but I will have that license before the end of the summer!) I have contested during the National QSO Party and ARRL's RTTY Roundup, attended meetings and dinners, and even got to draw the winning tickets for door prizes at the W4DXCC convention. I have worked all states on FT-8, dabbled in FT-4, and will hopefully get to learn CW this year as well. Slow absorption rather than jumping over the cliff works best for me when learning something new so I have gotten to take my time by watching and listening to gain the knowledge I have at this point. I hope I will always continue to learn something new and to seek out ways to use it. After all, I need to be able to out contest Steve at some point, don't I?

Cont'd on p. 7

When I first started my job in 2017, the names ICOM, Yaesu, Kenwood, MFJ, and many others were foreign to me. Now, they are household words. I am sitting in the garage, typing this article as the kerosene heater crisps me like a rotisserie chicken. Steve has his Pro 7 on his head while he calls out “Kilo, Four, Golf, India, Golf” during this weekend’s contest. We are surrounded by just about every type of ham equipment imaginable. It is in this shack that you will find us most nights and big portions of the weekend. It’s where we make plans for the future..not for 401k’s, trips, or grocery runs. We plan for antennas, stations, and power supplies. You know, the important things in life.

If ever questioned, I would say there is literally something for everybody in amateur radio and at every level. It is a life that is full and rewarding and I love every bit of it. I have made contacts all over the world and it has been so much fun to find a new operator out there to work. Yes, amateur radio has its practical purposes which we should all be thankful for. But I have gotten to delve into a hobby that promises gold for the treasure hunter at heart. As a woman, I am considered a YL but I am a ham radio operator and always will be.

Speaking of treasure hunt, sometimes the hunt for the perfect spot in the yard for an antenna to maximize its potential is frustrating and probably, well more than probably, dangerous.

That folded dipole is in a completely different location now (third time’s the charm). It took considerable time, a close call from the edge of the house roof, and a brick nearly through a front bedroom window to get it where it is today, but that’s a story for another time....

73, Jessica Beckling

KN4JJA

What Would Be Your Dream Station?

By Barry Johnson, W4WB

While we seemingly have some time on our hands for a few weeks, perhaps we can think about what your dream station would comprise and be located. Since this is a dream and not a nightmare, assume that funding the station is not an issue (but be reasonable since Congress didn’t include ham radio in the US \$2.2T bill). Some possible considerations to ponder are as follows:

- What are your communication objectives? [DX (of course), contesting, rag chewing, EME, etc.]
- What would your antenna farm look like? [type antennas, towers, etc.]
- Where would you locate your antenna farm?
- Would it be operated remotely? [Perhaps an important consideration as we get older or move into a non-ham friendly neighborhood.]
- What bands are of interest?
- What equipment would you specify? [Some for HF, VHF, UHF, etc. and power levels.]
- How automated would your station be?
- If a remote station, what about security and connectivity?
- What would your station configuration look like aesthetically? [A HAM cave with eating and sleeping facilities, bare bones functional, etc.]
- Would you allow “close ham friends” remote access?
- How permanent would your installation be?
- What do you think your dream station might cost? [Dollars, not spousal relationships.]

Send Bob your dream station ideas and he may add it to the Longpath. I’ll

start it off by summarizing my dream station and will hopefully expand on the theme later.

Given that I expect my wife and I will downsize in a few years and likely will move into a ham-unfriendly area, I would like a remote station configuration. My interests have always been DXing and contesting in the HF and VHF, so I limit my bands to 160m to 6m. The antenna farm would comprise a StepIR DB42 with the 80m option on a motorized crank-up DX-100HD Tashjian Tower. This covers 80m through 6m. A 160m antenna is an open item.

The primary radio would be an Elecraft K4HD with the KPA-1500 amplifier. Remote operation would use the K4/Ø remote head. The degree of automation is open in my mind. The station location would allow the transceiver to be located close to the antenna,

Cont'd on p. 9

DX Contests for April

By Chuck Lewis, N4NM

OK/OM DX Contest, (SSB), (160-10M)

Apr. 11, 1200Z to Apr. 13, 1200Z

Exchange: RS plus serial; OK/OM send RS plus county code (3 letters)

See: Page 71, April QST and www.okomdx.crk.cz

Yuri Gagarin International DX Contest, (CW), 160-10M

Apr. 11, 2100Z to Apr. 12, 2100Z

Exchange: RST, ITU zone

See Page 71, Apr. QST and gc.qst.ru/en/section/32

FTn DX Contest, (DIG), 80 – 10M

Apr. 11, 1200z to Apr. 12, 1200Z

Exchange: RST, State/Prov. EU send RST, S.N.

See Page 71, Apr. QST and europanft8club.wordpress.com

Japan Int'l. DX CW Contest (SSB), (160-10M)

Apr. 11, 0700Z to Apr. 12, 1300Z

Exchange: RST plus CQ zone; JAs send RST plus prefecture

See page 71, Apr. QST and www.jidx.org

Int. Vintage Contest HF, (CW & SSB), 80 & 40M

Apr. 12, 1200Z to 1800Z

Exchange: RS(T) & 4-char. Grid square

See page 71, Apr. QST and www.contestvintage.beepworld.it

ES Open HF Championship, (CW & SSB), 80 & 40M

Apr 18, 0500Z to 0859Z,

Exchange: RS(T) plus Serial #

Note: Dupes OK once per hour (see rules)

See Page 71, April QST and www.erau.ee/en

Worked All Provinces of China, (CW & SSB), 80-10M

Apr, 18, 0600Z to April, 19, 0559Z

Exchange: RS(T), and serial (or BY province abbr.)

See page 71, April QST and www.mulandxc.org

YU DX Contest (CW), 160-10M

Apr. 18, 0700Z to Apr 21, 0659Z (see website for times)

Exchange: RST plus Serial # ; YUs send County

See page 71, April QST and www.yudx.yu1srs.org.rs

CQMM Contest, (CW), 80-10 meters

Apr. 18, 0900Z to Apr. 19, 2359Z

Exchange: RST, continent abbrev., category

See Page 71, Apr. QST and www.cqmmmdx.com

SP DX RTTY Contest, (DIG), 80-10M

Apr. 25, 1200Z to Apr. 26, 1200Z

Exchange: RST, plus Serial # or SP province

See Page 71, Apr. QST and www.pkrvg.org



Helvetia Contest, (CW, SSB, DIG.), 160-10M

Apr. 25, 1300Z to Apr. 26, 1259Z

Exchange: RS(T) plus Serial # or Swiss canton

See Page 71, Apr. QST and www.uska.ch

OTHERS:

Holyland DX Contest,

April 17, 2100Z to Apr. 18, 2100Z

UKEICC 80 Meter Contest, CW,

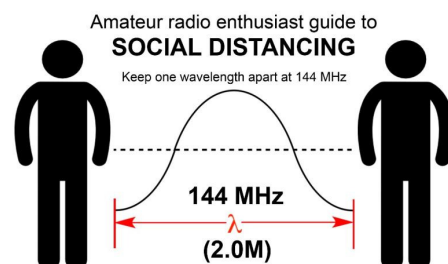
1800Z to 1900Z, Apr. 16

ARI International DX Contest

1200Z, May 2 to 1159Z, May 3

Dates & times often change or are misprinted in the journals; beware!

Chuck, N4NM



Submitted by Rudd Johnson W4TCD

A Low-Tech RFI Solution

By Mark Brown, N4BCD

On Tuesday March 17 we celebrated St Patrick's Day at the office – by leaving. In the previous week our company management had been keenly watching the developing storm of COVID-19 self-quarantine rules and restrictions, preparing us to work from home through training and signed telework contracts. They also configured our computer hardware against viruses and non-approved peripherals. Finally the word came down and we took our hardware home.

Finding room for another computer, two more widescreen monitors, and the mouse / keyboard was a challenge and I managed it by moving my rig control / logging computer closer to the radio. Everything was working well with the biggest aggravation being typing on the wrong keyboard or moving the wrong mouse.

That minor aggravation turned into a real problem the weekend of the CQ WW WPX Phone which I entered as High Power – Assisted. When the contest began at 7 PM local time Friday I swept 20m for the last of JA's before the band faded and then going to 40m. On 40m my relocated logging computer lost communication with the radio EVE-

RY TIME I transmitted. I moved and rerouted some cables but nothing made a difference so I shut down for the night.

On Saturday a call to Tom KG4CUI to chat about the analyzer results of my new 160m horizontal loop led to a discussion of my RFI issue. Tom's suggested solution was to use some aluminum foil around the cabling and the USB to Serial converter. Such a fix is a 12 step process – 6 steps into the kitchen for the foil and 6 steps back. It did not require a trip into the garage and trips up the ladder looking in boxes for clip-on ferrites. It didn't require a trip to Gigaparts either. Although I'd love an excuse to get in the car and drive somewhere, I digress.



The fix worked. I bunched up the excess cable and wrapped the bundle with aluminum foil and had no more comm problems on any band the rest of the weekend.



Mixing Work and Pleasure in N4BCD's shack.

My methodology in a 48-hour contest is to dabble a few hours here and there for the sheer fun of running and breaking pile-ups. On Sunday afternoon I finished with only 325 contacts but managed a new personal best – a 10 minute rate of 189 / hr.

I may have been lucky to have my work computer and shack paraphernalia coexist and even make it through a major contest. But should that not have worked, I had a contingency plan.



I need to test out that plan, just in case.

73 de Mark, N4BCD

Dream Station (cont'd from p. 7)

equipment be located in a secure building, and have at least 1 gigabit per second Internet connectivity. Also, the location of the station to my QTH should be within 30 minute-drive time. Would I allow other access to the station? You bet!

At this time, I am in the process of realizing my dream. I have a K4 ordered already. The location has been identified that meets my needs. Initially, I expect to erect a small tower with a five-band Hex-Beam. The total cost of the dream station is perhaps \$70K plus spousal relationship.

73 de Barry, W4WB

The Thrill of Victory- The Agony of Defeat-

By Steve Werner, AG4W

How fitting that I should learn today on April 1 that D4C won the CQWW SSB contest in 2019. I thought it might of been an April Fools prank. When the 3830 scores were posted we came in second. We were so disappointed at the end of the contest when we saw the score from EF8R. After they reviewed the logs we had about 400 less QSOs, but more multipliers that put us over the top. Final score D4C 42,192,920 vs. 41,951,525. The win was all about our logging accuracy at D4C. Kelly, NOVD the other US operator that went over with me had particularly good accuracy. Your accuracy can come from good ears or a great receiving system. It is much harder to have good accuracy on 160 meters due to noise and weak signals. This can be seen by the number of repeat requests that are required. Over last weekend in the CQ WPX SSB contest on 40 meters I worked a lot of very weak stations. I was concerned by the time it took to build a call and get a serial number right. I could tell by the number of stations that patiently waited for me to get finished with a difficult QSO. The D4C team proved how important accuracy is even with 15,666 QSOs. It was so exciting to hear the good news today with all the bad news from the virus. I was particularly pleased for my Italian friends who have had a very rough time.

It turns out based on the 3830 report I came in second in the US for sin-

gle operator high power on 40 meters in the CQ WPX SSB contest. I also came in second last year. This year I was beat by N5DX who used a full size 5 element 40 meter yagi at 90 feet. It is no surprise that he could work Europe and Japan better than me with my 3 element parasitic vertical. He could also open the band earlier and close the band later than me. He was also able to put in the seat time. In 2015 and 2018 I won the US in the WPX SSB contest on 40 meters with about 20 percent lower scores. Sometimes it is also about who shows up to compete in your category.

Speaking of that I also found out this week I won the US in the CQWW RTTY contest in 2019 for single operator high power. This is my favorite contest of the year and I have been trying to win it for many years. I have had a number of top 10 finishes. I even won not using SO2R which I was beginning to believe was impossible for that contest. I was lucky I think because the propagation was such that only one band was good at a time. Sometimes poor sunspots can work in your favor. That's what the North American winner

said about using his SO2R station. He got the North American win operating much fewer hours than I did. I have found my new purple cushion to be a winning edge in contests. The more time you can keep your butt in the chair the better chance you have of winning. The professional truck drivers use this cushion. I now know why.

73 Steve AG4W

Moved to Tennessee

By Walt Miller, AJ6T

My XYL and I have moved to Clarks-ville, TN, and I'm in the slow process of setting up a station here in EM66 on 15 acres. We still have our house in Madison (my step-son is living there), and my remote controlled FT8 station is still operational there. I had planned to attend the Visalia DX Convention in April, but I canceled my trip due to the corona virus pandemic. I have snagged a few new band countries while remaining isolated in our new house, but my goal of 3000 Challenge credits is quite a ways off.

73 de Walt, AJ6T

The LongPath Staff

Publisher/Editor:

Tom Duncan, KG4CUY

Departments:

Chuck Lewis, N4NM, DX Contests

Chris Reed, AI4U, Minutes

Bob De Pierre, K8KI, From the President



The Purple Cushion

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We're fast approaching the day when vacuum tube technology will move from a practical art to the realm of folklore. Historically ardent hangers-on to tube technology—hams and broadcast transmitter operators—are more and more persuaded to adopt newer and more efficient technologies. Tube amps are supplanted by switching amplifiers using fancy variants of the MOSFET sporting extremely low “on” resistances. Broadcast transmitters use solid-state modules—5 kW is a typical size—which may be paralleled through combiners to deliver many tens of kW to the antenna. So the era of the 4CX25000-based transmitter is pretty much behind us.

But there is one area where tubes seem destined to hang on forever, and that's the tube audio market. We're not talking giant fire-breathing external-anode tetrodes here, but still reasonably-sized glass tubes with several hundred volts on the plate and hundreds of watts output in push-pull-parallel combination. The story does not end with power amplifiers, as tube preamps are prized for “tubey” purity of sound. Oddly, “tubey” distortion is also prized in guitar amps, sometimes introduced in the preamp, and sometimes in the power amp.

Perhaps, then, tubes will be around for a little while longer (though we might be counting the users on one hand), and if that's the case, a knowledge of tube history might be of some practical value, and is certainly of academic interest. We need to extract this history from the remaining practitioners with first-hand experience so far as possible. Texts of the tube period are valuable, such as the *Radiotron Designer's Handbook* published in many editions by RCA, and *Radio Engineering Handbook* edited by Keith Henney, McGraw-Hill, 1959. There are

many such period publications, but also a few modern ones owing to the tube audio phenomenon, such as *Valve Amplifiers* by Morgan Jones, Elsevier, 1995.

Explanations of tube theory generally begin by covering the Edison Effect, the Fleming Valve, and the DeForest Audion, and then treat in more detail space charges, secondary emission, and the functions of additional grids and beam-forming electrodes. The thorough texts do not gloss over the place where the magic begins: the cathode. Directly- and indirectly-heated cathodes, cathode material, heater material, cathode-to-heater potential limitations for indirectly-heated tubes, distortion products (not just hum) introduced by AC-powered filaments, work functions, mono-molecular layers...are topics pertinent to the end of the tube where electrons leave the metal.

As alluded to previously, we must be mindful of the maxim that history is written by the victor. This is as true regarding the history of technology as the history of civilizations: the victor is lionized, and the vanquished are marginalized. As an example, consider the point-contact transistor. A modern textbook on solid-state electronics will cover bipolar junction transistors, field effect transistors of all varieties, diodes, and thyristors, but no mention will be had of point-contact transistors. The argument that the student needn't know about a dead technology that's no longer available in order to be a competent engineer is probably true, but in fact this missing device did exist. At some point the knowledge of the circumstances leading to its demise might be useful: another maxim says we learn from our mistakes, or we are destined to repeat them. This does not mean the vanquished technology was inferior to the victor—Beta vs. VHS is an

oft-cited example.

Back to the cathode. Our history books and the three good texts called out previously treat the generation of heat necessary to spew out electrons as an electrical process — after all, the vacuum tube was the descendent of the electric light bulb. For generations we have come to expect this: if a tube radio stops working, the first diagnostic inquiry is “do the tubes light up?” Without delving into history, even that is mis-guided, as any owner of a 1.5V filament radio like the Zenith Trans-Oceanic is aware: some tubes have such puny filaments they barely light up, and certainly produce just about no heat.

In fact cathodes were heated by a variety of imaginative means for years without consuming a watt of electrical power. Such tubes existed alongside electrically-heated ones and in most important respects functioned identically. We offer several examples.

The radio in the Italian *Mefisto Sede Calda* and *Super Calda* automobiles used tubes with cathodes indirectly heated by the engine coolant. At a distance, these tubes looked like any 7-pin miniature tube, but close inspection revealed that pins 3 and 4 were in fact tubing similar to a hypodermic needle, feeding water into and out of a heater coil concentric to the cathode just like a filament. Once the engine got up to temperature (which it did very quickly indeed in the *Super Calda*) the radio was available for use. Volume was controlled by a valve which regulated the flow of water through the heater, very similar to how volume was controlled in an Atwater-Kent radio with filaments: by controlling filament temperature. These cars were prone to overheating, so on a blazing July day

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Heaters, Filaments, and Cathodes

(continued from p. 12)

the drive down Mount Vesuvius could be dicey. Common shade-tree-mechanic advice to the owner of an occasionally-overheating car was “turn on the heater full blast.” The same applied to the Sede Calda and Super Calda—just crank up the volume on the radio, and the engine would cool down by the time you passed Herculaneum.

Electrical power in an automobile is generally plentiful enough that electrically-heated cathodes don't rob power from anything that can't afford it. But before the transistor, filament drain in a portable radio was very important indeed and typically much greater than “B-battery” power. In Bavaria, Austria, and portions of Switzerland weekend family camping outings were very popular right after WWII. Kohlenmann, a great manufacturer of camping equipment, wanted to offer a portable radio with battery life exceeding Blaupunkt and Grundig units. They came up with the idea of mounting all the tubes on a metal plate which was placed on top of the campfire. The grid, screen, and plate electrodes were connected to asbestos-insulated wires which ran to the other half of the radio containing everything except the tubes. All the cathodes were grounded — these were indeed directly-heated tubes, with grid

bias supplied by a C battery. After a nice al fresco (im freien?) dinner, throwing another log on the fire ensured the radio would provide entertainment to the wee hours.

Our last example is from the U.S. Receiving tubes were not the only things which gave non-electrically-heated cathodes an honest trial. Up until the early 1970's live, locally-produced kids shows featuring a home-grown Bozo the Clown or one of his kin were Saturday morning television fare. The gorilla of TV equipment manufacturers was RCA. They were experimenting with cameras that didn't require blazingly hot studio lights which melted the talent's makeup after a few minutes. This meant that in addition to switching from vidicon camera tubes to more sensitive image orthicons, every other means of reducing heat output was fair game. The tube filaments in the experimental TK-52WHF camera were therefore converted to water heating, with the water heater mounted outside the studio in the camera control unit: RCA thought the name Plum-bicon would be just right for these tubes, but Philips had already latched on to this name. Since the connecting cable was already 1.5" diameter, a little bit more for heater piping didn't

amount to much. The camera was very similar to the TK-42 it was modeled after. An ambitious cameraman at WQSY-TV discovered the one difference between a TK-42 and a TK-52WHF, and fitted his new camera with a squirt gun powered by the cathode water. Bozo was indeed astounded when he found himself at the receiving end of the squirt gun's first production use. Thank goodness for the bleep button!

Other cathode heating methods were tried, with little acceptance. Liquid sodium was suggested for transmitting tubes. An early microwave oven used gas from the stovetop above which it was mounted to heat the magnetron. Electrical heating soon supplanted all these other methods, and their existence expunged from historical record.

Let this serve as a positive reminder to scientists, engineers, entrepreneurs, and yes, historians. In an era when the whiz-bang technology-du-jour is held on a pedestal for all to worship, there is still more than one way to skin a cat.

From the VOX Publisher

By Mark Brown, N4BCD

[The following is copied with permission from the April 2020 Huntsville Amateur Radio Club VOX.—ed.]

From the President

(cont'd from p. 1)

Last month we voted to place an inscribed brick in the Diamond Terrace in Newington in honor of Craig Behrens, NM4T, now a Silent Key, past president of the club, and longtime LongPath editor. I have coordinated the action with his family. I will also order a lucite replica and present it to his XYL.

Treasurer's Report

By Chris Reed, AI4U

Balance on March 1	\$ 8,321.63
Member Paypal Deposits	520.75
Membership Deposits	180.00
Reimbursement to Bob for DX Banners	-32.70
Balance as of March 31	\$ 8,989.68

We are living through a truly historic moment – a worldwide pandemic with state-ordered limits on travel and self distancing. As hams we practice for emergencies but this one is different than the April 27, 2011 tornado outbreak. In the aftermath of that local disaster, in what I refer to our HARC's finest hour, many of us were without power for days and 148 of our HARC's members rose to the occasion providing tactical and relay communications between served agencies when cellular

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From the VOX Publisher

(continued from p. 12)

and landline service were not functioning. [As reported in the May 2011 VOX—ed.]

This pandemic is different. Our cell phones work, our internet & landlines are intact, and the roads aren't blocked by trees. Instead of assisting served agencies we're hunkered down in our homes and hamshacks avoiding contact to slow the spread of COVID-19.

Anyone tuning a radio lately has probably noticed an uptick in casual CQ's on the HF bands and perhaps a little more activity on the repeaters. It seems hams across the world are using the home time to get on the air. I have to say it's certainly more enjoyable to ragchew with folks around the world than the depressing news on TV.

Personally I've been working from home but can't resist the urge to have the radio tuned to a high band to jump on an E-skip opening. I urge you to use some spare time to get on the air, maybe try a new mode.

Changing hats for a moment... As Chairman of the Huntsville Hamfest I've directed our committee to proceed with our planning and preparations for Hamfest 2020. August is still a long way off and we're keeping our fingers crossed that we'll have a hamfest.

My heart sank getting a call from Dayton Chairman Jack Gerbs ahead of their announcement to cancel. Since then SEA-PAC, another Division convention in the Northwest and numerous others have pulled the plug. Attendees are disappointed, vendors are sitting on inventory, and volunteers are sad-

dened having to wait for the next year. While unfortunate everyone agrees the correct decisions were made.

Here in Huntsville we remain hopeful, and in phone calls I've offered our tangible support to the ARRL and Dayton organizations if they wish to use Huntsville for conferring awards, do interviews, and other innumerable things that didn't get to occur this year in Dayton. We will host The World's Friendliest Hamfest in August, but only if it's safe to do so.

Cheers & 73,

Mark N4BCD
Huntsville Amateur Radio Club – VOX
Publisher
Huntsville Hamfest - Chairman

VP Corner

By Steve Molo, KI4KWR, NADXC Vice President

Hope everyone is staying safe in this current situation we are all facing. Still full swing for me at GigaParts and making customers happy daily which is always good. With everyone stuck at home the bands have been alive morning and night. Here is what I have seen in the last 30 days.

160 Meters: Activity was rather low except during Contests. FT8 activity is growing around 1840. Try to avoid frequencies divisible by 5 (e.g. 1820, 1825, 1830 etc.) since broadcast birdies are often there.

75/80 Meters: Activity has increased slightly especially during the pandemic in 3830-3930 with FT8 activity increasing on 3574.

60 Meters: Many more entities have now received permission to operate on this band albeit they are often limited

to 15 Watts and a dipole antenna. Most DX activity is now concentrated on the third channel around 5357 and almost entirely on the FT8 mode. Over 200 DXCC entities have been active on the band. FCC is still looking at non-channelized operation near channel 3. The ARRL DXCC program still does not recognize 60 meter contacts.

40 Meters: The Deserving are often active on CW on the bottom of the band especially during darkness hours and during contests. Much activity has now moved to the digital modes, especially FT8 around 7074. SSB is mostly above 7100. Remember that USA stations cannot operate SSB below 7.125 MHz but best to stay above 7.128 for safety. Most of the world can now operate from 7000-7200.

30 Meters: FT8 mode and other digital modes are usually found between

10.135-10.150 MHz. I have been on FT8 here daily for two weeks working on DXCC/WAS and remember USA stations are limited to 200 Watts output power.

20 Meters: 20 meters continues to be the band especially during daylight although some of the activity has moved to the digital modes between 14070-14090. SSB activity is still high.

17 thru 6m: Have seen some DX on there but not hearing anything from my list postage stamp backyard but maybe if I raised the hexbeam I might see something and not rely on the folded dipole J

DX Contesting: DX contests are everywhere using CW, SSB and digital modes. S&P or use a DX Cluster. We have two local options for DX clusters. I

Cont'd on p. 14

March Meeting Minutes

By Chris Reed, AI4U, NADXC Secretary/Treasurer

The March meeting of the North Alabama DX Club was called to order at 620p by President Bob DePierre, K8KI.

Bob welcomed our visitors to the meeting: KK4WVN, and KX4WVN. Bob mentioned Jessica, KN4JJA had participated in the recent ARRL International DX contest. Both Jessica and Vice-President Steve Molo, KI4KWR made 70 contacts.

DX worked as noted on the meeting by the members where covered by Bob. South Orkney, VP8PJ and Zambia, 9J2LA. The latter the club supported with a donation.

Bob called for a motion to approve the minutes as published in the LongPath. Steve, KI4KWR made the motion, seconded by John, N5DF. The motion carried.

Chris covered the financial report noting their were two recent deposits outstanding from membership dues paid.

A motion was made to approve the financial report, seconded and the motion carried.

Steve, AG4W covered the postponement of the Swains DXpedition due to Coronavirus. They hope to be on the air in September. Stay tuned for dates.

Bob presented two applications for membership:

Jessica Bickley, KN4NJJA

Susan Seaford, AI4VV

A motion was made for each and seconded. The motions carried and NADXC welcomed our two newest members.

Tom, KG4CUI explained the process of changing of the bylaws to allow for e-mail notification of the change to the constitution as published in the LongPath as well as the notice just given at this meeting.

Bob, K8KI announced the recent passing of member Craig Behrens, NM4T. Craig was active in the DX club, having served as president and LongPath editor for a number of years. One of Craig's passions of the hobby include QRP. Craig led a QRP event on Monte Sano State Park during the weekend of the Huntsville Hamfest. The event grew larger each year with many amateurs travelling to Huntsville for this QRP event. He will be missed.

Bob suggested that we honor Craig with a brick at ARRL Headquarters in Newington. A motion was made by Steve, AG4W and Tim, AB4B.

A plea for articles for the Longpath was made along with a request for topics for programs or volunteers to present a program.

Next was the upcoming DX challenge by Bob and cheating was encouraged by using the website at NG3K.com.

Upcoming DX include 9JL2A, Zambia, T07DL, Reunion Island, 9X2AW, Rwanda and EX0QR, Kyrgyzstan.

We have invited Ralph Fedor, KOIR to be the Hamfest Banquet Speaker and are awaiting his reply.

Bob, Steve and Chris met with Springhill and placed a \$200 deposit to reserve the banquet room.

Steve Smith, KY4G announced that he is still taking cards for shipment to

the ARRL. It saves money to bundle QSL cards and send them to the league.

Next meeting will be April 14 at Newk's University Drive in Huntsville.

Steve, KI4KWR and Steve, AG4W made the motion to adjourn. The meeting was adjourned at 6:46 pm.

Tom, KG4GUY presented the program: DX History, The times they are a changin.

Respectfully submitted,

Chris AI4U,

NADXC Secretary/Treasurer,

VP Corner

(continued from p. 13)

use K4ZR for my HFClock and KG400L for HRD/N1MM and WinTest. Both are great and the KG400L even has a [Google App](#) for Android.

K4ZR K4ZR.no-ip.org:7300
DX Spider

KG400L dxfind-
er.bfielding.com:7300 (Cloud Server
Based)

Hope to hear everyone on the repeater Tuesday for our Meeting over the air and Presentation by K8KI.

73,

Steve KI4KWR